

What is Claimed is:

1. An air conditioning system comprising:

an outdoor unit having a compressor and an outdoor heat exchanger;

an indoor unit installed in a ceiling, having an indoor heat exchanger with a space therein in communication with a room, a fan in the space for drawing air and discharging through the indoor heat exchanger, guide means on an underside of the indoor heat exchanger, for guiding the external air to the room through the fan, and the room air to an outside of the room, and a preheat exchanger arranged adjacent to, and in communication with the guide means, for indirect heat exchange of the external air and room air passing therethrough; and

an air supply duct and an air discharge duct respectively connected to the preheat exchanger, for guiding the external air to the room, and the room air to the outside of the room.

2. The air conditioning system as claimed in claim 1, wherein the fan includes a centrifugal fan that draws air from under and discharges in a radial direction as the fan rotates.

3. The air conditioning system as claimed in claim 1, wherein the guide means includes;

a first duct arranged under the indoor heat exchanger for guiding the external air from the preheat exchanger to the fan, and

a second duct arranged under the first duct for guiding the room air to the preheat exchanger.

4. The air conditioning system as claimed in claim 3, wherein the guide means is formed as one unit.

5. The air conditioning system as claimed in claim 3, wherein the guide means includes;

a first hole provided in a central part thereof in an up/down direction such that the space and the room are in communication,

at least one or more than one second hole provided around the first hole in the up/down direction such that the air passed through the indoor heat exchanger is introduced into the room.

6. The air conditioning system as claimed in claim 5, wherein the fan is provided over the first hole.

7. The air conditioning system as claimed in claim 5, wherein the indoor heat exchanger stands on a top of the guide means along a position between the first hole and the second hole.

8. The air conditioning system as claimed in claim 5, wherein the first duct includes;  
at least one or more than one first inlet provided to one side surface thereof in communication with the preheat exchanger, and

at least one or more than one first outlet formed in an inside surface thereof in communication with the first hole.

9. The air conditioning system as claimed in claim 8, wherein the first duct further includes a first mesh provided to the first outlet for removing foreign matters from the air.

10. The air conditioning system as claimed in claim 5, wherein the second duct includes;

at least one or more than one second inlet provided in an inside surface thereof in communication with the first hole, and

at least one or more than one second outlet provided in an one side surface thereof in communication with the preheat exchanger.

11. The air conditioning system as claimed in claim 10, wherein the second duct further includes a second mesh provided to the second outlet for removing foreign matters from the air.

12. The air conditioning system as claimed in claim 1, wherein the preheat exchanger is arranged to surround an outside circumferential surface of the guide means.

13. The air conditioning system as claimed in claim 1, wherein the preheat exchanger includes a plurality of units in communication with one another.

14. The air conditioning system as claimed in claim 13, wherein the unit includes;  
a vacant case having a third outlet in communication with the first inlet of the guide means, and a fourth inlet in communication with the second outlet of the guide means, and  
means in the case for indirect heat exchange between the external air passing through the first inlet and the third outlet, and the room air passing through the second outlet and the fourth inlet.

15. The air conditioning system as claimed in claim 14, wherein the heat exchange means includes;

first flow passages arranged at regular intervals for flow of the external air, and

second flow passages arranged between, and in contact with the first flow passages, for flow of the room air.

16. The air conditioning system as claimed in claim 14, wherein the heat exchange means includes;

a plurality of plates arranged at regular intervals to form the first flow passages for flow of the external air and the second flow passages for flow of the room air in layers, alternately, and

a plurality of flow guides between the plates of the layers in parallel to flow directions of the external air and the room air, each having a cross section with continuous folds.

17. The air conditioning system as claimed in claim 16, wherein the fold has a peak and a bottom in contact with a top surface and a bottom surface of the plates.

18. The air conditioning system as claimed in claim 16, wherein the flow guides are arranged perpendicular to each other for perpendicular flow of the external air and the room air.

19. The air conditioning system as claimed in claim 1, further comprising an air

supply fan in the air supply duct for supplying the external air to the room.

20. The air conditioning system as claimed in claim 1, further comprising an air discharge duct in the air discharge duct for discharging the room air to the outside of room.